

## **REMARKS**

### **Status of the Claims**

Claims **1-5, 7, 8, 10, 13-25, and 27-29** are pending in the application. In the Office Action, claims 1, 2, 4, 5, 7, 10, 13-19, 22, 23, 25 and 27-29 were rejected under 35 USC § 103(a) as allegedly unpatentable over U.S. patent 6,754,414 to Naghieh *et al.* (hereinafter “Naghieh”) in view of U.S. patent 5,578,818 to Kain *et al.* (hereinafter “Kain”) in further view of Japanese published abstract JP57084339 to Motokawa *et al.* (hereinafter “Motokawa”). In the Office Action, claims 3, 8, 20, 21, and 24 were rejected under 35 USC § 103(a) as allegedly unpatentable over Naghieh in view of Kain in view of Motokawa in further view of well known practices in the art.

In this response, no claims are amended. Upon entry of this response, claims **1-5, 7, 8, 10, 13-25, and 27-29** are presented for examination.

### **Initial Comments**

Applicants note for the record that the prior Office Action mailed on August 20, 2008 indicated allowable subject matter. Applicants amended the claims to comply with the requirements expressly set forth in that Office Action, *i.e.*, to incorporate all limitations of the base claim and intervening claims. The Examiner has carried out a new search and incorrectly cited (as JP357084339) foreign art in rejecting Applicants claims previously indicated as allowable without providing a copy of the art to the Applicants. Applicants note, “Copies of cited foreign patent documents and non-patent literature...are automatically furnished without charge to applicant together with the Office action in which they are cited.” (MPEP 707.05(a)) Applicants request that copies of any foreign patent documents and non-patent literature cited in an Office Action be furnished to the Applicants.

### **35 USC § 103(a) Rejections of Claims: 1, 2, 4, 5, 7, 10, 13-19, 22, 23, 25 and 27-29**

In the Office Action beginning at page 3, claims 1, 2, 4, 5, 7, 10, 13-19, 22, 23, 25 and 27-29 were rejected under 35 USC § 103(a) as allegedly unpatentable over Naghieh in view of Kain in further view of Motokawa. In particular and with regard to independent claims 1, 7, and 10, the Examiner states at page 4 that “[it] would have been obvious to one of ordinary skill in

the art at the time the invention was made to provide a system wherein the excitation and detection optical paths being substantially coaxial..." [sic] Presumably, the Examiner proposes that Naghieh can be modified based on the teachings of Kain. The Examiner then relies on Motokawa to "incorporate polarizers...into the invention of Naghieh" to reach all elements of Applicants claims 1, 7 and 10. Applicants respectfully traverse the rejection.

To establish a *prima facie* case of obviousness, the prior art must teach or suggest every element of the claim. Further, when prior art elements are combined each element must merely perform the same function as it did separately and any proposed modification or combination cannot change the principle of operation of prior art relied upon or render the prior art unsatisfactory for its intended purpose (MPEP 2143.01 V and VI). Also, in setting forth a rejection "the prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from the claimed invention" (MPEP 2141.02 VI). Applicants respectfully submit that the Examiner has not considered the cited references as a whole, has not provided evidence of a reasonable motivation to combine the references, and that the suggested combination would change the principle of operation of prior art relied upon and/or render it unsatisfactory for its intended purpose.

In particular, Naghieh is directed to excitation of a microdot with light delivered from an optical fiber (21) and collection of fluorescent emission with an objective lens (31). Naghieh is not silent with respect to the excitation and detection optical paths as the Examiner states. In particular, Naghieh teaches "[t]he optical system is arranged such that the direction of travel of the excitation light differs from the direction along which the emission light is collected, *i.e.*, the two paths do not have a common axis." (Col. 2, lines 43-46, emphasis added.) Naghieh further teaches, "by separating the excitation and emission light paths, systems in accordance with this invention limit the excitation and emission optics to a single function each, thereby permitting individual optimization of these two optical systems." (Col. 3, lines 1-5.) Therefore, an intended purpose of the Naghieh apparatus is to have non-coaxial excitation and detection optical paths. The Examiner relies on Kain for a teaching of coaxial excitation and detection optical paths. However, modifying Naghieh according to Kain to combine the optical paths is contrary to the teachings of Naghieh and would render the Naghieh apparatus unsuitable for its intended purpose. Applicants noted this previously in the response filed April 28, 2008 (page 8), to which the Examiner has not responded.

Further, it is unclear how Naghieh could be altered, or incorporated into or modified by Kain, to combine the two light paths. For example, how could the collimating lens (31) be aligned collinearly with the fiber (21) wherein the fiber is within 0.1 mm to 3 mm from the microdot (Col. 4, lines 43-46), or how could the fiber of Naghieh be incorporated into Kain so that the fiber is within 0.1 mm to 3 mm from the microdot? Applicants invite the Examiner to clearly articulate how Naghieh could be modified according to Kain without rendering Naghieh unsuitable for its intended purpose.

Kain is directed to a substrate designed to improve fluorescence emission. (See Abstract and Col. 3, lines 27-30.) An embodiment in Kain discloses a scanning focused-beam fluorescence imaging system used to excite fluorescence on the substrate. Such an imaging system is designed to provide high-resolution, two-dimensional images of fluorescing features on the substrate, *e.g.* microscopic images. (Col. 1, lines 10-11; Col. 1, lines 14-30; Col. 4, lines 7-9; Col. 4, lines 33-34; Col. 5, lines 27-30) The Examiner has provided no articulated reasoning how Kain could be modified based on the teachings of Naghieh to arrive at Applicants claims. If the Examiner suggests that the fiber of Naghieh could be incorporated into Kain, the arguments above with respect to Naghieh still apply. If the Examiner suggests that the LED of Naghieh could be incorporated into Kain, the principle of operation of Kain would be changed such that it would be rendered unsatisfactory for its intended purpose. For example, replacing the laser with an LED would result in incoherent and broader band light. This would result in a larger spot focus which would spoil the resolution of the imaging system. Further, removing the scanning apparatus of Kain removes its two-dimensional imaging capability. Applicants submit that any of these modifications of Kain would render it unsuitable for its intended purpose. Additionally, Applicants recognized such scanning systems as complex and to be avoided, *i.e.*, use a complex scanning system is divergent from the path taken by Applicants to arrive at the claimed invention. (See Applicants' published application, paragraphs 12 and 13.) For at least the reasons set forth above, Applicants submit that one of ordinary skill in the art would not combine Kain with Naghieh.

The Examiner relies on Motokawa for a teaching of polarizers. Motokawa is directed to the use of broadband (white light) illumination (9), spectrometers (10 and 19) and rotating polarizer (17) to determine parallel and perpendicular polarization components of fluorescent emission from a sample cell. Motokawa's system utilizes the two polarization components for

analysis of the sample. Applicants note that rotating polarizers would not always block unwanted wavelengths and therefore would not be used to modify Nagheih or Kain to arrive at Applicants' claimed invention. Alternatively, the use of fixed polarizers, *e.g.*, polarizers oriented at 90 degrees only, would render Motokawa unsatisfactory for its intended purpose. Fixed polarizers would only provide information about the perpendicular component and would not provide information about the parallel component of polarization, which is required for the Motokawa system. Applicants submit that the Examiner is using impermissible hindsight analysis in regards to Motokawa, and that for the reasons above one of ordinary skill in the art would not combine the rotating polarizer of Motokawa with either Naghieh or Kain.

Applicants further note that Motokawa, similar to Naghieh, has separate excitation and emission light paths. Accordingly, Motokawa does nothing to cure the deficiencies of Kain or Naghieh regarding coaxial excitation and detection optical paths. Applicants submit that the arrangement of separated beams for Motokawa is used to collect a greater amount of fluorescent emission from the sample cell. If the Examiner suggests that Motokawa could be modified to arrive at Applicants' claims, Applicants submit that Motokawa could not be modified to have coaxial paths without changing Motokawa's principal of operation or rendering it unsatisfactory for its intended purpose.

As set forth above, Applicants submit that combining Naghieh with Kain and Motokawa would render each apparatus unsuitable for its intended purpose. Additionally, combining Kain with Naghieh to arrive at coaxial excitation and detection optical paths would be contrary to the teachings of Naghieh. For at least these reasons, Applicants respectfully submit that claims 1, 7, and 10 are patentable over Naghieh, Kain and Motokawa, and request reconsideration and withdrawal of the rejection under 35 USC § 103(a) of these claims.

Claims 2, 4, 5, 13-19, 22, 23, and 25 depend from arguably allowable independent claims 1, 7, or 10. No specific rejection was set forth in the Office Action for claims 28 and 29, which also depend from claims 10 and 1, respectively. The reasons set forth above with respect to claims 1, 7, and 10 are repeated and apply with equal weight to each of these dependent claims. Accordingly, Applicants submit that claims 2, 4, 5, 13-19, 22, 23, 25, 28 and 29 are also patentable over the cited art and request reconsideration and withdrawal of the rejection under 35 USC § 103(a) of these claims.

In the Office Action at pages 6-7, the Examiner rejects claim 27 as unpatentable over

Naghieh in view of Kain. The above reasoning with respect to claims 1, 7 and 10 in regards to Naghieh and Kain when applied *mutatis mutandis* to claim 27 bears equal weight and yields similar results. Applicants submit that Naghieh and Kain could not be combined without changing the principle of operation of at least one of the references or rendering at least one of the references unsatisfactory for its intended purpose. For at least these reasons, Applicants respectfully submit that claim 27 is patentable over Naghieh and Kain, and request reconsideration and withdrawal of the rejection under 35 USC § 103(a) of this claim.

Applicants additionally request clarification from the Examiner. At page 7, the Examiner attributes a “polarizing beam splitter 24” [sic] to Kain, and states “a polarizer is a dichroic material that functions to convert a randomly polarized beam of light into respective desired components.” Applicants have identified beamsplitter 23 in Kain, but find no support for the definition provided by the Examiner. If the Examiner is providing Official Notice, Applicants respectfully disagree with the definition in which the Examiner appears to be confusing dichroic beamsplitters with polarizing beamsplitters. The principles of operation of the two optical elements are different. The Applicants invite the Examiner to provide evidence in support of the proffered definition, “dichroic material that functions to convert a randomly polarized beam of light into respective desired components” or withdraw the statement. For a convenient description of polarizers, please see <http://en.wikipedia.org/wiki/Polarizer>.

35 USC § 103(a) Rejections of Claims: 3, 8, 20, 21, and 24

In the Office Action beginning at page 8, claims 3, 8, 20, 21, and 24 were rejected under 35 USC § 103(a) as allegedly unpatentable over Naghieh in view of Kain in view of Motokawa in further view of well known practices. In particular the Examiner gives Official Notice that uses of short band pass filters and lock-in amplifiers were well known practices in the art. Without agreeing with the Examiner’s Official Notices, Applicants respectfully traverse the rejection.

Claims 3, 8, 20, 21, and 24 depend from independent claims 1 or 10 directly or through intervening claims. The reasoning set forth above with regard to the rejection of claims 1 and 10 are repeated and apply with equal weight to each of these dependent claims. The Official Notices with respect to the band pass filter and lock-in amplifier do nothing to cure the deficiencies of Naghieh, Kain or Motokawa. Therefore, Applicants submit that claims 3, 8, 20,

21, and 24 are patentable over Naghieh, Kain, Motokawa, and the Official Notices, and request reconsideration and withdrawal of the rejection under 35 USC § 103(a) of these claims.

**CONCLUSION**

In view of the above, Applicants submit that all presently pending claims are in condition for allowance, and early indication thereof is respectfully requested. If the Examiner feels that a telephone call would expedite the prosecution of this case, the Examiner is invited to call the undersigned at (617) 248-4801.

Applicants believe no additional fees are due with this response, but if Applicants are in error any fees due, or overcharges, may be applied to deposit account 03-1721 referencing docket number 2006571-0003.

Respectfully submitted,  
CHOATE, HALL & STEWART LLP

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/John D. Lanza/  
John D. Lanza  
Registration No. 40,060

CHOATE, HALL & STEWART LLP  
Intellectual Property  
Two International Place  
Boston, MA 02110

Phone: (617) 248-5000  
Fax: (617) 502-5002  
patentdocket@choate.com